Chapter 4
Environmental Resources, Open Space, and Farmland

Vision

In the year 2020, Lake County will have a superior open space network that preserves natural resources, cultural resources,[1] and farmland to promote and enhance functioning ecosystems, agricultural activities, and the quality of life of all residents.

Significance

The interaction of the forces of nature have resulted in a landscape in Lake County that is abundant in its variety of environmental resources including prairies, woodlands, lakes, wetlands of all types, and various species of flora and fauna. Environmental resources and open space were among the most frequent topics sited by participants at the *Regional Framework Plan* Public Forums. "Green space" was identified as the third most important quality of life factor (after "quality schools" and "less traffic congestion") in the Lake County Resident Transportation Survey (Lake County Department of Communications 2000). Protecting the environmental and cultural resources, open space, and farmland of the County from the impacts of residential and commercial development is a major challenge.

This component of the *Regional Framework Plan* will provide mapping and analysis of the distribution of environmental and cultural resources, open space, and farmland in Lake County. Trends in agricultural activities will also be analyzed. This chapter includes countywide inventory maps and policy maps that identify areas that are most appropriate for environmental resource preservation and enhancement and areas that are most appropriate for development, as called for in *A Consensus Plan for Enhancing & Preserving Lake County's Quality of Life* (Consensus Plan Committee, 1998:3) and suggested by planning experts such as Randall Arendt (1994:253) and Ian McHarg (1992:31), as well as the Natural Lands Trust (1997:3-2).

This chapter strives to provide a framework for preserving and enhancing natural resources as an integrated system that conserves natural ecosystem functioning and contributes to the quality of life in Lake County. The analysis and policy recommendations contained in this chapter provide an important parameter for other *Lake County Regional Framework Plan* chapters. In particular, this chapter supports a Future Land Use Map and policies that respect environmental and cultural resources, while accommodating desirable development.

Issues and Opportunities

- Open space, environmental amenities, and recreation opportunities are key components of the County's quality of life and a major determinant factor in business retention and location decisions.

- Water resource-based tourism contributes to the County's economic vitality.

[1] Cultural Resources include historic resources, archaeological resources, and scenic landscapes.

- Preservation of environmental resources and open space is a top priority of Lake County residents.
- Lake County Forest Preserve District referenda demonstrate the public's support for open space acquisitions.
- As development pressure continues to increase, the opportunity to preserve open space and farmland is being lost.
- Impervious surfaces (roof tops, parking lots, etc.) caused by development are key contributors to increasing flooding and decreasing water quality.
- The quality and quantity of Lake County's water resources including Lake Michigan, other surface waters, wetlands, and groundwater aquifers are being threatened by development and human activities.
- The most cost effective method for managing stormwater is to utilize the natural hydrologic system including stream corridors, lakes, floodplains, wetlands, and depressional storage areas.
- Existing state laws do not encourage creative programs, such as purchase of development rights and transfer of development rights programs, to protect environmental resources, open space, and farmland.

Analysis

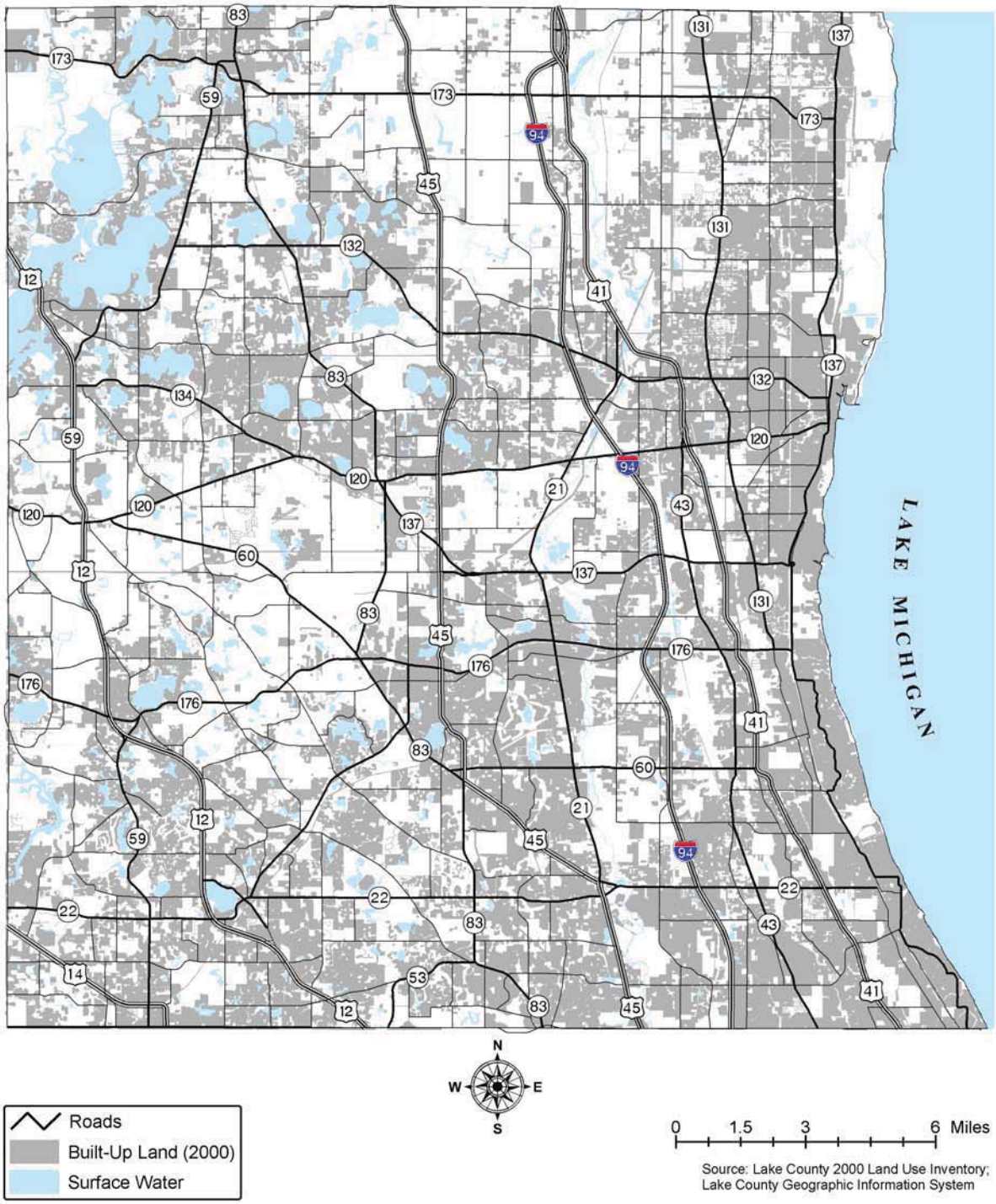
Development Pattern

Figure 4.1 shows the built-up areas of the County based on the Lake County 2000 land use inventory. Areas considered built-up include residential (excluding farm houses); government/institutional; industrial; office/research; retail/commercial; transportation facilities and rights-of-way; utilities/waste facilities and rights-of-way; and disturbed land. Areas not considered to be built-up include farmhouses; agricultural land; all public and private open space and recreational areas (including golf courses); forest/grasslands; wetlands; and areas with open water.

Lake County's first permanent settlement of European-Americans was established in 1834, only one year after Chicago was established as a village. According to land use inventories completed by NIPC and revised by the Lake County Department of Planning, Building and Development, 125,463 acres, or 44% of the County's land area[2] was developed by 1990. By 2000 the developed area increased by over 14,000 acres to 139,655 acres, or 49% of the County's land area. This is an 11.3% increase in the developed land area in 10 years.

[2] For the purpose of this analysis the County's land area is defined as 284,257 acres, which equals the total County area (301,152 acres) minus the open water area (16,895 acres). Open water areas are subtracted from the County area in order to avoid under-stating the percentage of the County that is developed. The remainder of the statistics presented in this chapter and in Chapter 9, Land Use, are based on the County's total area.

Figure 4.1
Built-Up Areas



Watershed Planning and Stormwater Management

The land area that contributes stormwater runoff to a particular point along a waterway is referred to as its watershed. More specifically, the watershed is the area of land confined by topographic divides surrounding a stream, river, wetland or lake (waterbody) that drains to that waterbody.

The watershed includes not just the surface of the land, but also the area below the surface where precipitation that infiltrates into the soil flows into the waterbody from underground. In Lake County, the four major watersheds are the Lake Michigan watershed, the North Branch of the Chicago River watershed, the Des Plaines River watershed, and the Fox River watershed. These watersheds are divided into 26 smaller areas known as sub-watersheds. Watershed and subwatershed boundaries are shown on Figure 4.2.

Watersheds provide an important geographic boundary for understanding and managing natural resources. Watershed-level planning considers protecting land and water resources that extend beyond jurisdictional boundaries while reducing negative impacts of land development such as flood damage, soil erosion, habitat loss, and water pollution. As Lake County continues to grow, there is a need to predict and manage, through watershed planning, how land use changes will affect the natural hydrologic system of streams, lakes, and wetlands and the high quality habitats and environmental resources they connect.

Nearly 90,000 acres or 30% of Lake County consists of lakes, streams, wetlands, and floodplain areas, as discussed in the environmental resource inventory section of this chapter. In the past, these areas have naturally stored and conveyed the heaviest of rainstorms. From a taxpayer's standpoint, it is more cost-effective to protect, restore, and enhance lakes, streams, wetlands, and floodplain areas to achieve multiple objectives of flood control, water quality, habitat, open space, topsoil moisture, and aesthetics.

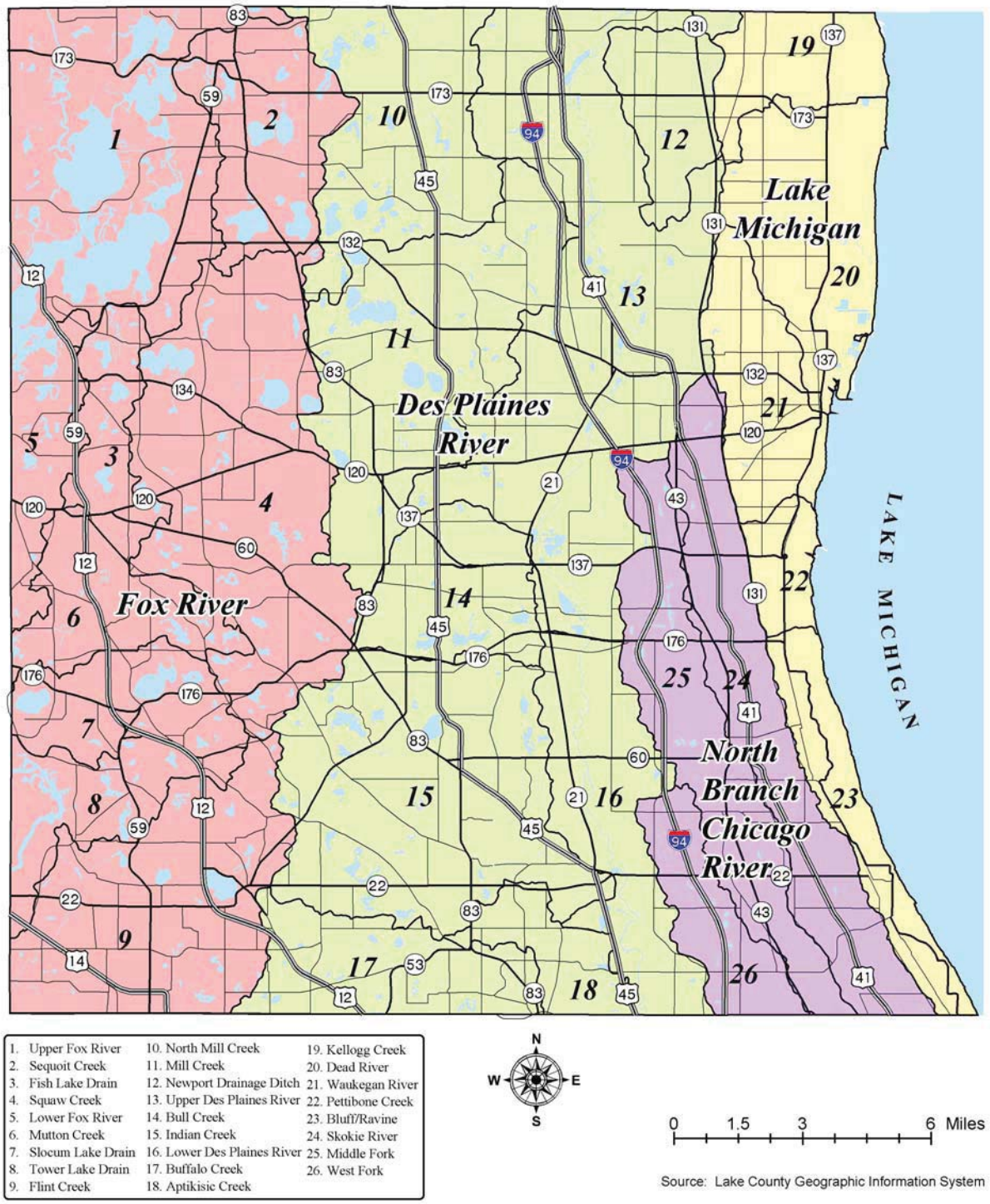
A holistic and integrated approach to environmental resource protection, enhancement and management, must include stormwater management goals and policies. The 1994 *Framework Plan* states that the natural hydrologic "system is as much a part of the infrastructure network as our man-made roads, sewers and utility lines." Additional goals and policies related to comprehensive stormwater management are included in Chapter 5, Infrastructure and Services.

Environmental Resources

This *Plan* contains an inventory and description of Lake County's environmental, cultural, and open space resources. The inventory is based on existing data sources that have been provided by local, state, and federal agencies. The resources described in this *Regional Framework Plan* include:

1. Illinois Natural Areas Inventory Areas;
2. Threatened and Endangered Species;
3. Lakes, Ponds, Rivers, and Streams;
4. Wetlands;
5. Hydric Soils;
6. Flood Areas;
7. Forested Areas;
8. Steep Slopes;
9. Protected Open Space;
10. Aquifer Recharge Areas;
11. Scenic Landscapes; and
12. Historic, Archaeological, and Paleontological Resources.

Figure 4.2
Watersheds and Subwatersheds



In addition to the resources listed above, Highly Erodable Land and Prime Agricultural Land are described and mapped in the Farmland Protection section of this chapter.

The maps and analysis contained in this *Regional Framework Plan* are based on existing inventory and mapping data provided by local, state, and federal agencies. Inventory data and maps are not available for Forested Areas; Aquifer Recharge Areas; Historic and Archaeological Resources; and Scenic Landscapes.

Figure 4.3 contains a table listing the geographic area for each of these resources for which inventory data are available. Many resources overlap such that the acreage shown in the table cannot be summed to determine total resource areas within the County. The resources that have been inventoried and mapped are depicted on the Environmental Resource Inventory map that accompanies this *Regional Framework Plan*.

Illinois Natural Areas Inventory Areas

Illinois Natural Areas Inventory (INAI) areas are shown in Figure 4.4. These areas contain exceptional or unique environmental resources, as designated by the Illinois Natural Areas Inventory of the Illinois Natural History Survey and the Division of Natural Heritage (IDNR). Within the County, 15,847 acres have been identified as INAI areas. The Illinois Natural Areas Inventory is not a comprehensive listing of all the sites in Lake County that might contain exceptional or unique environmental resources. Identification of a site as an INAI area is not sufficient to ensure the preservation of the natural resources or of the many Threatened and Endangered Species found at these locations. INAI areas may be publicly or privately owned and may be protected or unprotected. INAI areas should not be confused with State Natural Areas, such as Volo Bog and Redwing Slough, which are state owned and maintained.

Threatened and Endangered Species

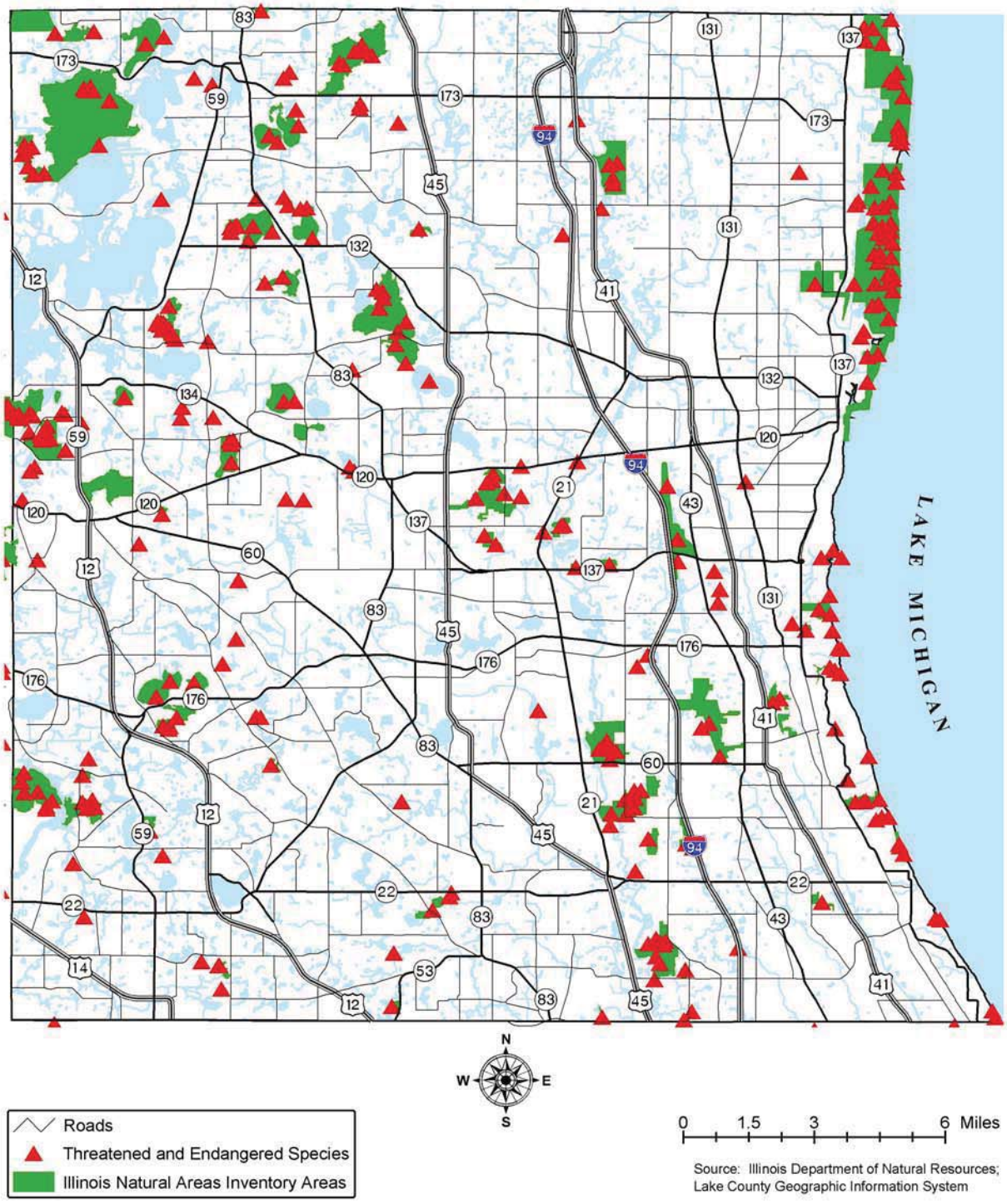
Lake County has over 130 different known threatened and endangered (T&E) species, as classified by the Illinois Department of Natural Resources, the most of any county in Illinois. These species have been identified at 554 sites, which are shown on Figure 4.4. These sites represent locations at which a species was found, trapped, or collected, and therefore only indicates that species' presence at the time of the last observation. Threatened and endangered species in Lake County include birds, fish, insects, plants and reptiles. Threatened and endangered species sites also include natural communities and rookeries. All threatened and endangered species have been identified by qualified biologists.

Many threatened and endangered species sites are located within existing State Parks, State Nature Preserves, and Lake County Forest Preserves. However, threatened and endangered species sites are located on private property where they may be negatively impacted by development. Persons developing land in the vicinity of known threatened and endangered species sites are required to engage in a natural resource consultation process with the Illinois Department of Natural Resources. Many threatened and endangered species have large territories that extend beyond where they have been observed. Regardless of their range, many species require large contiguous areas to provide the healthy conditions and habitat necessary for their survival.

Figure 4.3
Environmental Resources

Resource	Acres	Square Miles	Percent of County Area
County Area	301,152	470.55	-
Illinois Natural Areas Inventory Sites	17,533	24.76 27.39	6%
T&E Species	554 point locations (no area)		
Forested Area (not mapped)	37,110	57.98	12%
Steep Slopes (8% and greater)	11,854	18.52	4%
Surface Water			
Lakes and Ponds	16,895	26.40	6%
High Value Aquatic Resource Streams	34 miles		
Moderate Value Aquatic Resource Streams	52 miles		
Wetlands and Soils			
ADID Wetlands (with 100-foot buffer)	38,474	60.11	13%
Lake County Wetland Inventory Wetlands	61,495	96.09	20%
Hydric Soils (non-built-up areas only)	67,497	105.5	22%
Flood Areas			
Floodplains and Floodways	52,108	81.42	17%
Flood of Record	52,898	82.65	18%
SMC Flood Hazard Mitigation Areas	5,663	8.85	2%
Protected Open Space			
State Parks and State Natural Areas	7,799	12.18	3%
Lake County Forest Preserve Land	24,220	37.84	8%
Libertyville Township Open Space	1,535	2.40	0.5%
Nature Preserves	5,194	8.11	2%

Figure 4.4
Illinois Natural Areas Inventory Areas



Surface Water

Surface water is shown on Figure 4.5. Lakes, ponds, rivers, and streams store and convey water from rainfall and snowmelt. They serve as habitats for plants, aquatic life, and animals. They provide many passive and active recreational activities and provide scenic and spiritual amenities. Certain water bodies, such as the Chain-O-Lakes and Lake Michigan, attract tourist revenues to Lake County.

Lake County is bordered on the east by Lake Michigan, the largest lake completely located within the United States and the fifth largest lake in the world. Lake Michigan has an average depth of 279 feet, a maximum depth of 923 feet, and 1,640 miles of shoreline. Despite its massive size, Lake Michigan has a limited ability to provide water for human use and to absorb pollution. To protect the Lake, water withdrawals are regulated by International and U.S. law, as discussed in the Water Supply section of Chapter 5, Infrastructure and Services. Discharges into Lake Michigan are also regulated by International laws, the Great Lakes Water Quality Agreement (1972) and the U.S. Clean Water Act (1972).

The shoreline of Lake Michigan is not static. "The historical record of coastal change along the Illinois shore of Lake Michigan indicates that the most dynamic coastal area in the state [of Illinois] is located between the Wisconsin-Illinois state line and the Waukegan Harbor" (Illinois State Geological Survey, 1998:1). Erosion and accretion creates a constant need to dredge harbor areas and fill along the shoreline.

The Chain-O-Lakes region in the northwest portion of the County contains a concentration of lakes. Major lakes in that area include: Grass Lake, Fox Lake, Pistakee Lake, and Lake Nippersink. Major lakes in the central portion of the County include Third Lake, Fourth Lake, and Round Lake. Major lakes in the southern portion of the County include Slocum Lake, Bangs Lake, and Lake Zurich. The major rivers flowing through Lake County include the Fox River, the Des Plaines River, and the North Branch of the Chicago River. There are over 350 lakes and ponds in Lake County with a total area of 16,895 acres.

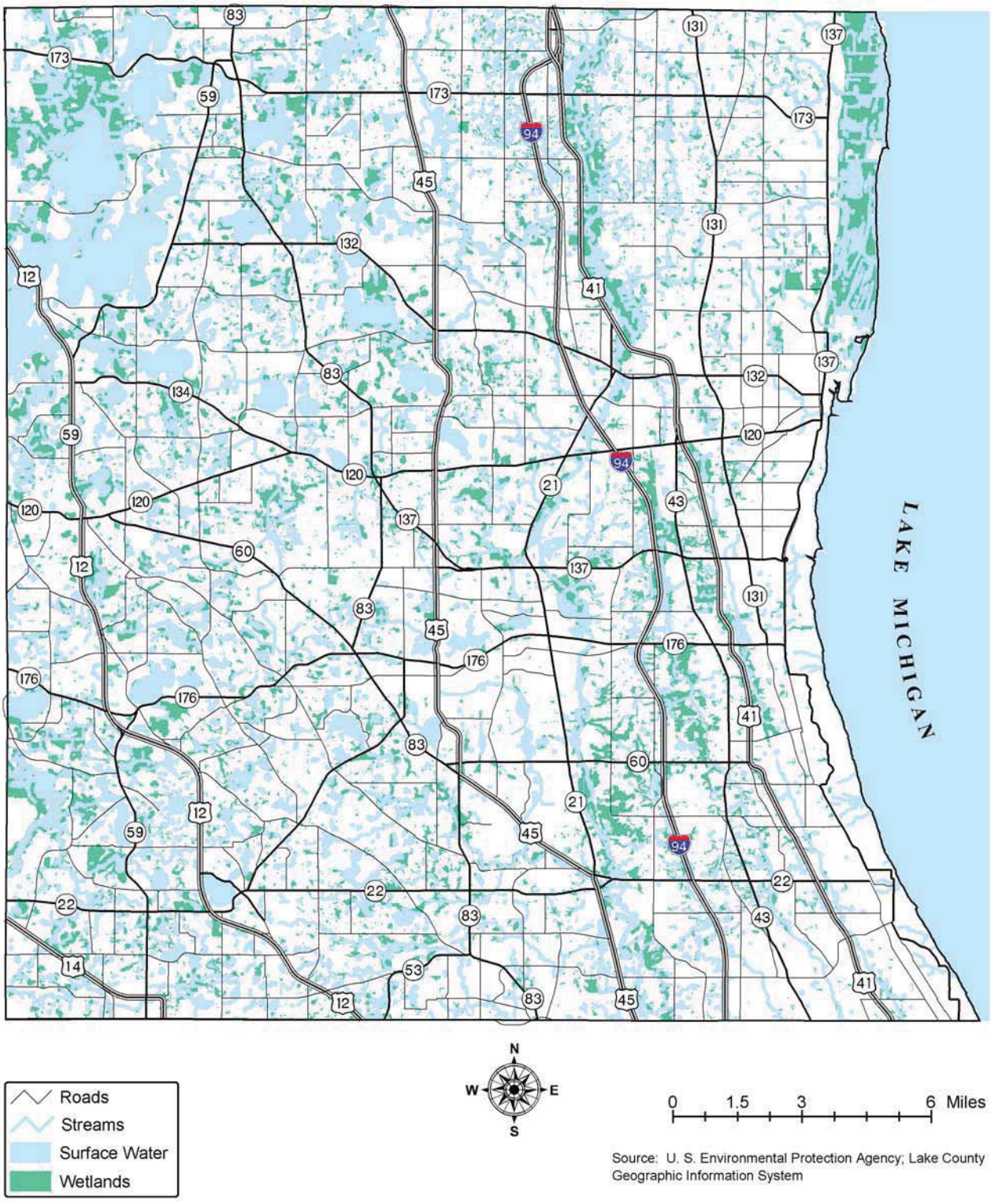
The Illinois Environmental Protection Agency's (IEPA) Biological Stream Characterization (BSC) program provides a biological assessment of stream quality. No Lake County stream segments are classified as Class A, Unique Aquatic Resources, streams. Lake County has 33.6 miles of Class B, High Value Aquatic Resource, streams and 51.7 miles of Class C, Moderate Aquatic Resource, streams. The County also has 74.3 miles of Class D, Limited Aquatic Resource, streams, which are not mapped.

Steps need to be taken to protect Lake County's vast water resources, including Lake Michigan from agricultural and urban runoff, industrial waste, and sewage overflows. Best Management Practices (BMPs) should be promoted throughout the County to improve absorption and groundwater infiltration opportunities for runoff, including the retention of topsoil.

Examples of BMPs include:

- Use a cluster approach for subdivision design that leaves as much of a site as possible in large-area open space.
- Use vegetated open channels instead of curb and gutter, where appropriate.
- Use permeable or porous paving instead of asphalt or concrete where possible.

Figure 4.5
Surface Water and Wetlands



- Use natural landscaping that thrives in the local environment to reduce the need for pesticides, herbicides, fertilizer, and watering.
- Use roof runoff to maintain a rain garden.
- Minimize the impervious area of parking lots.

Additional goals and policies related to BMPs are included in Chapter 5, Infrastructure and Services.

Wetlands

Wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation, which is adapted for life in saturated soil. Wetlands provide habitat for fish and wildlife and store and filter pollution from stormwater run-off, thereby reducing flooding and protecting water quality.

The Lake County Wetland Inventory, which is maintained by the Lake County Department of Management Services, GIS Division, identifies 61,495 acres of naturally occurring and artificial wetlands, including farmed wetlands, in Lake County. The U.S. Environmental Protection Agency has identified certain wetlands within Lake County as having exceptional functional values. These "Advanced Identification" (ADID) wetlands cover 38,474 acres, including 100-foot buffers. Most, although not all, ADID wetland areas are also included in the Lake County Wetland Inventory. Both Lake County Wetland Inventory and ADID wetlands are shown on Figure 4.5.

Maintaining the health of Lake County's remaining wetlands requires reducing the pollution in run-off from impervious surfaces, and retaining absorbent soils and deep-rooted vegetation in bordering buffer areas.

Hydric Soils

Hydric soils retain water and support rich biological communities. They are formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper portion. Hydric soils are associated with and include many surface water and wetland areas. They have poor drainage, complicating the construction of basements, roads, and septic fields. Building in these soils can increase flooding and decrease water quality. As identified in the *Soil Survey Lake County, Illinois* (U.S. Department of Agriculture, 1970), hydric soils cover an area of 90,145 acres within the County. Of this area, approximately 22,648 acres have been developed, based on the 2000 Land Use Inventory, and an additional 16,436 acres are located under surface water bodies. Thus, there are approximately 51,061 acres of remaining hydric soils in Lake County, which are mapped in Figure 4.6. These areas need to be protected in order to purify water and channel runoff into streams, rivers, and aquifers.

Flood Areas

Floods are natural events that occur when the volume of water entering a lake, pond, river, or stream causes the waterbody to overflow its banks. Most flood events in Lake County are

triggered by periods of heavy rainfall and/or rapid snowmelt. While it is natural for water bodies to over-bank, the frequency and severity of flooding is increased due to human activity. Creation of impervious surfaces, installation of drain tiles and storm sewers, stream channelization, and loss of top soils and wetlands all increase the volume and speed of runoff reaching water bodies. Lake County has numerous areas of land that are partially or completely inundated with water during flood events. Flood areas include riverine floodplains, which occur along rivers, streams, lakes, and ponds, and non-riverine floodplains, which occur in depressional areas.

Flood Areas in Lake County can be identified through several mechanisms including Flood Insurance Rate Maps (FIRM) published by the Federal Emergency Management Agency (FEMA), floods of record identified in the Hydrologic Atlas published by the U.S. Geologic Survey (USGS), and local identification programs, including the Lake County Stormwater Management Commission's Flood Hazard Mitigation Areas. These flood areas are shown on Figure 4.7.

Mapped regulatory floodplains and floodways, as identified on FIRM maps, cover 52,100 acres in Lake County. Mapped regulatory floodplains are defined as the area of land that is inundated with water during 100 year storm events. Floodways are the channel and that portion of the floodplain that is adjacent to the channel that are particularly critical to storing and conveying flood discharges.

The USGS Hydrologic Atlas (1963–1968) places 52,898 acres within areas inundated by historic floods of record. Most, but not all, of these areas are also located in regulatory floodplains and floodways. In addition, the Lake County Stormwater Management Commission has identified 410 areas that cover 5,700 acres of land with local drainage and flooding problems. Over half of these areas are outside of regulatory floodways and floodplains.

All flood prone areas, with a tributary area of 100 acres or more, are regulated as floodplain, regardless if they are mapped by FEMA. A substantial portion of flood damage occurs outside of mapped regulatory floodplains and floodways. Changes in the frequency and severity (height) of flooding due to inappropriate development can result in increasing the size and height of the regulatory floodplain.

Minimizing impervious surfaces and restoring prairies and wetlands throughout the watershed are essential to reducing the frequency and severity of flooding. Minimizing development in flood prone areas is essential for ensuring the safe conveyance of floodwaters and for protecting human life and property.

Forests and Prairies

Forests and prairies provide a habitat for plants and animals, protect soils, filter rainfall, buffer air and noise pollution, and provide scenic beauty. No geographic survey data exists regarding the extent of remaining native prairies or prairie remnants. Forested area was inventoried for preparation of the Lake County Forest Preserve District *Land Acquisition Plan, Part One, Land Classification and Site Suitability Systems* (Lake County Forest Preserve District 1989) based on 1985 and 1986 aerial photos. At that time, forested area in the County totaled 37,110 acres.

Figure 4.6
Hydric Soils in Non-Built Up Areas

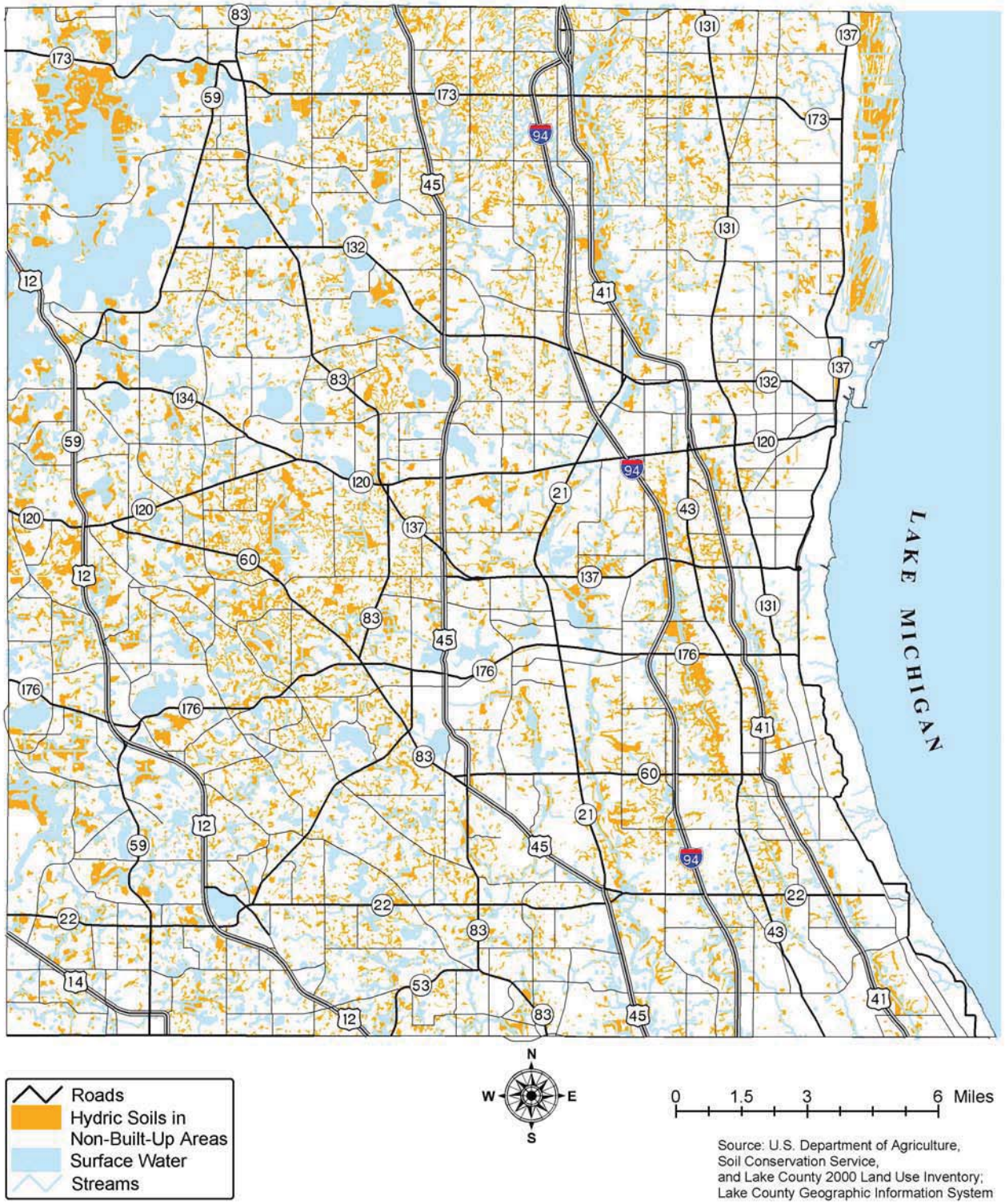
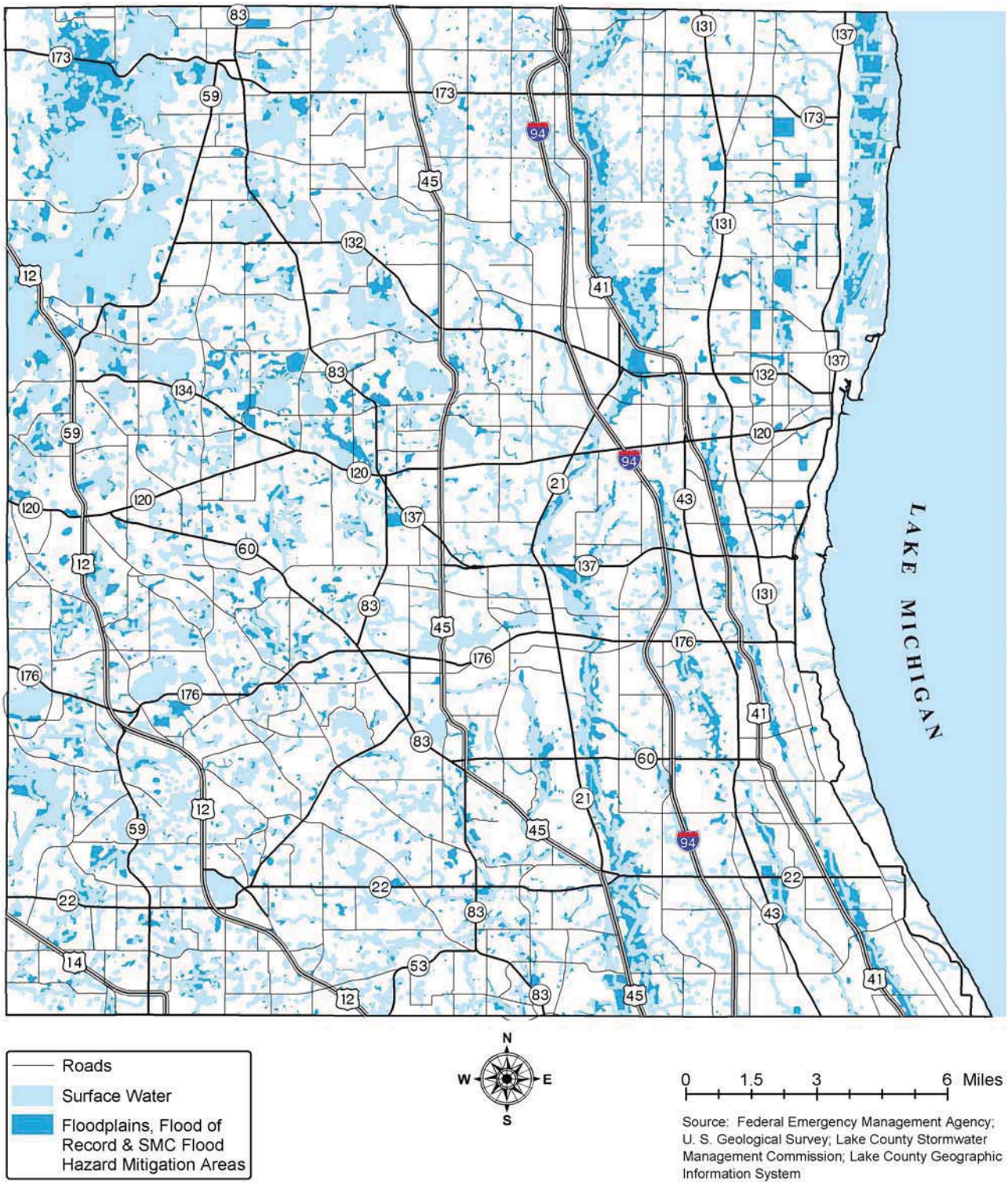


Figure 4.7
Surface Water and Flood Areas



Tracts of forested area ranged in size from less than one acre to over 1,000 acres. Of the total forested area, just under 22,000 acres was contained within tracts of 40 acres or larger; just under 9,100 acres was contained within tracts of 160 acres or larger.

The 2000 Land Use Inventory identified 27,101 acres of Forest and Grassland, which are defined as areas with trees and grass cover that are not in agricultural use or within areas designated as public and private open space (such as Forest Preserves or State Parks). From this inventory it is not possible to separate forest areas from grassland areas. The definition of grassland areas is not the same as prairie.

Forest and prairie areas are not included on the environmental inventory maps. This *Plan* contains a policy recommendation to map forest areas for future planning and open space acquisition efforts.

Steep Slopes

In Lake County, steep slopes are typically associated with water features. Disturbing these slopes can lead to loss of native vegetation, soil erosion, and, ultimately, reduced water quality (Lake County, 1994:9-3). Slopes of 8% and greater, as derived from United States Geologic Survey (USGS) 7.5-minute Digital Elevation Models (DEMs), cover less than 4% of Lake County. These slopes are shown on Figure 4.8. The most notable steep slopes are the ravines located along the southern two-thirds of the County's Lake Michigan shoreline. Other steep slopes occur along the County's other lakes and streams. Although limited in geographic extent, steep slopes present a significant development constraint and should be protected from inappropriate development.

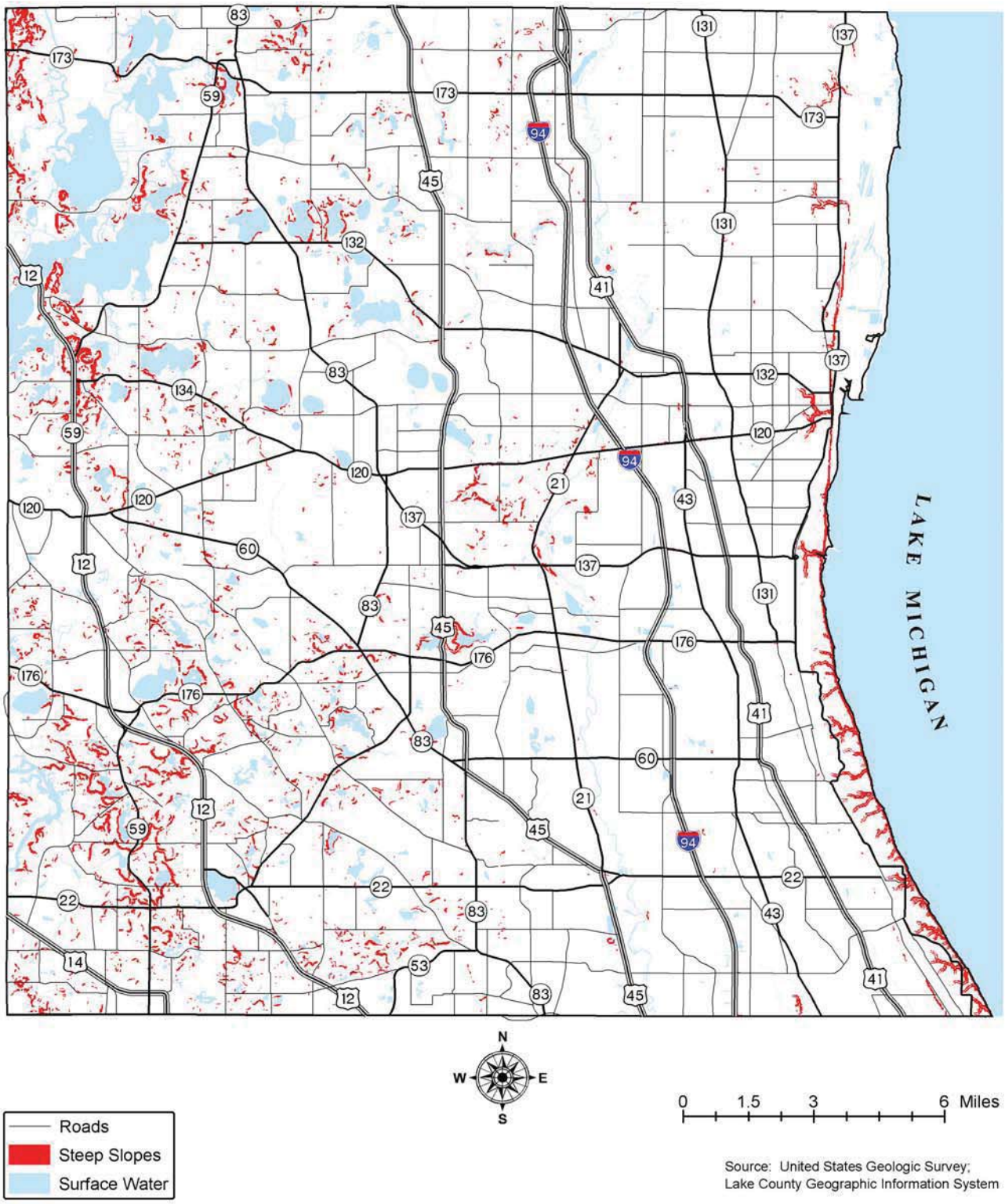
Protected Open Space

State, County, and local governments have protected over 34,500 acres of land, which is approximately 11% of the area of the County, for natural resources protection and enhancement. Existing protected open space, as shown in Figure 4.9, includes State Parks and State Natural Areas, Lake County Forest Preserves, Libertyville Township open space, and State Nature Preserves. The mapped open space does not include municipal and township parkland nor does it include private conservation land. Municipal and township parks are mapped and discussed in the Park and Recreation Section of Chapter 5, Infrastructure and Services.

The state of Illinois has established Illinois Beach State Park on the shore of Lake Michigan and the Chain O' Lakes State Park. Illinois Beach State Park contains 3,357 acres of land. Chain O' Lakes State Park contains 3,125 acres of land, a small portion of which is in McHenry County. The state has also established Volo Bog, in Grant Township, and Red Wing Slough, in eastern Antioch Township. Each of these State Natural Areas contains over 700 acres.

The Lake County Forest Preserve owns 23,039 acres of open space. Major properties, over 700 acres, include the Lakewood Preserve, Rollins Savanna, Wadsworth Savanna, Independence Grove, Van Patten Woods, Waukegan Savanna, and the Ryerson Woods Conservation Area.

Figure 4.8
Steep Slopes



Libertyville Township also has an active open space preservation program. The township has purchased 78 parcels of land and acquired conservation easements on an additional 13 parcels, thereby protecting 1,535 acres of open space. The township has acquired conservation easements on portions of two additional parcels of land, which are not mapped.

An Illinois Nature Preserve is a high quality natural area that has been permanently protected by state law due to the rare plants, animals, or other features present. State Nature Preserves can be under public or private ownership. There are 28 State Nature Preserves located totally or partially within Lake County. These preserves contain nearly 5,200 acres of protected land, all of which are located on publicly owned land except for approximately 1,019 acres. Public access is not provided in State Nature Preserves that are under private ownership and may be restricted in State Nature Preserves that are owned and managed by public agencies.

In addition to the open space included in the Environmental Resource Inventory map, local government agencies and not-for-profit conservation groups within the County are working to protect open space and environmental resources. Additional open space is also protected through deed-restrictions and set-asides required by the land development and subdivision process of Lake County and many municipalities. No comprehensive inventory exists of these areas, which contribute to the maintenance of perpetual open space in Lake County. This *Plan* contains a recommendation for mapping these areas.

Beyond providing environmental resource protection, these areas also provide significant recreational and tourist opportunities. In 2000, Illinois Beach State Park had 2.5 million visitors, Chain O' Lakes State Park had 1.3 million visitors, and the Volo Bog State Natural Area had 51,500 visitors. The Lake County Forest Preserves average 2.5 million visitors annually. These visitors contribute to the local economy, as discussed in Chapter 3, Employment and Economy.

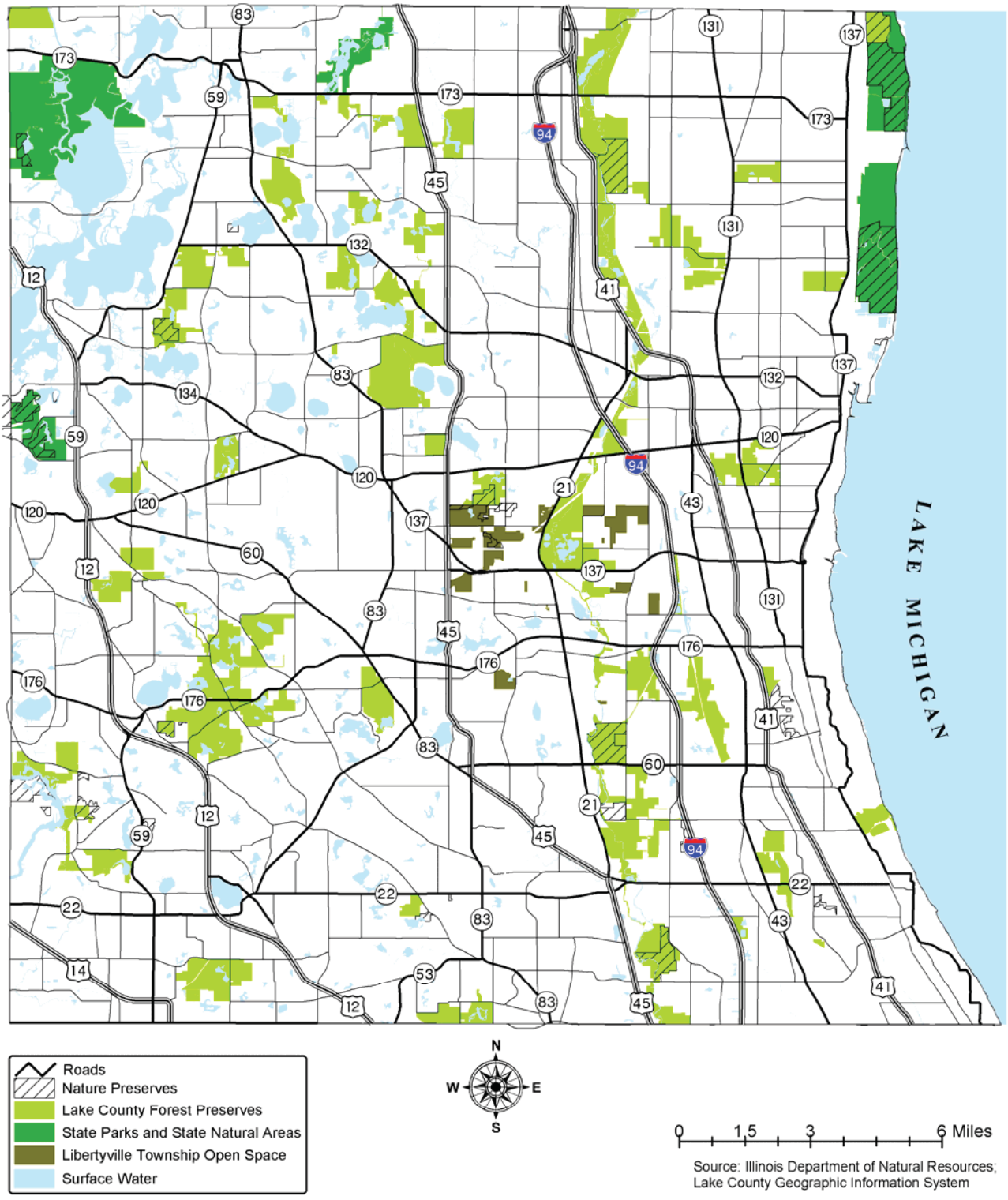
The conservation of open space by private landowners should be encouraged through conservation easements and not-for-profit organizations. Land purchased for open space by public agencies and private conservation organizations should be maintained for such uses.

Aquifer Recharge Areas

Aquifers are subsurface areas that store groundwater. Aquifers are important sources of water for human consumption, as described in Chapter 5, Infrastructure and Services. Aquifers are also an important source of base flow for rivers, lakes, and wetlands. Aquifer recharge is the replenishment of aquifers by water seeping from the land's surface into the groundwater. The water that recharges the aquifers comes from rain, snowmelt, and some lakes and rivers (NIPC, 2001:64). The recharge areas for Lake County's deep bedrock aquifers, which are generally 750 to 1,549 feet deep, are in Wisconsin and McHenry, Boone, DeKalb, and Kane counties (Larsen, 1973:18). The County's shallow aquifer system, which is up to 749 feet deep, is recharged by local precipitation.

The Illinois Groundwater Protection Act (415 ILCS 55/) required the Illinois Department of Natural Resources to conduct a statewide groundwater assessment. This assessment identified three high recharge areas in Lake County. These are the western edge of the County, the Des Plaines River, and Illinois Beach State Park. Aquifer recharge in the rest of Lake County is primarily moderate to moderately low.

Figure 4.9
Protected Open Space



Detailed geologic mapping of aquifers and aquifer recharge areas is needed throughout the Great Lakes region. The U.S. Geological Survey along with the states of Illinois, Indiana, Ohio, and Michigan have formed the Central Great Lakes Geologic Mapping Coalition. The Coalition will identify the location of aquifer recharge areas and the shallow aquifers, provide the geologic information needed for modeling aquifer recharge, and provide information on the vulnerability of shallow aquifers to contamination (Berg et al., 1999:22, Table 3; 35, Table 7).

Because of urban expansion and the resultant impacts on groundwater resources and wetlands, Lake County has been designated as one of the highest priority areas of the program. Mapping has been started for the northwestern two-thirds of Lake County. The Central Great Lakes Coalition's entire mapping program will take a minimum of 17 years to complete if adequately funded. Because Lake County is a high priority, maps of the County should be available in the next few years.

Lake County and the municipalities must be prepared to act when the maps become available showing the priority recharge areas. Lake County and the municipalities may need to revise their comprehensive plans, zoning maps, and land development regulations. To help protect groundwater resources, the Water Supply section of Chapter 5, Infrastructure and Services, contains a policy recommendation that Consumptive Use Permits be required for wells that produce 100,000 gallons or more per day or 70 gallons per minute. The Consumptive Use permit will require analysis of the impacts of the proposed well on other existing wells and surface waters.

Historic and Archaeological Resources

Lake County's historic and archaeological resources provide a context that can be used to guide current development and land use decisions. Historic preservation is a tool that can assist in building a desirable future by drawing from the community's formative roots. The economic benefits of historic preservation can include: construction activity, an increase in property values, and revenue from tourism (Morris, 1992:1). Redevelopment of older areas reduces public costs by making more efficient use of existing infrastructure. It has also been found that providing incentives for rehabilitation projects that follow the principles of historic preservation can have a "catalytic effect" leading to the rehabilitation of additional properties (Morris, 1992:12). Redevelopment and infill development should be designed to be compatible with the context of a community's historical development patterns (Morris, 1992:35-36).

Identifying historic and archaeological sites in advance of construction allows the costs of mitigation to be considered in the project budget. Encountering a site after construction has started can be extremely expensive, and produce results that are not satisfactory to either the developer or the community. While usually associated with greenfield sites, archaeological sites might also exist beneath built-up, urban areas. This possibility has to be considered when infill or redevelopment projects are being planned, especially if state or federal funds are involved.

Archaeological sites can range from Paleo-Indian prehistoric sites; to areas of contact between the historic Indian groups and the early French explorers and traders; to 20th century historical sites. Sites dating from the American settling of Lake County in the 1830s and '40s can include farmsteads, churches, bridges, water powered mills, transportation routes (trails, early roads, rail lines), quarries, water towers, spring houses, rural schools, and resorts. Many of the County's prehistoric and historical sites may have significance as landmarks at the local, state, or national

level. But there has been no known effort to proactively inventory all archaeological and historic sites in Lake County.

The state has several statutes dealing with historic preservation. Among these are the "Illinois Historic Preservation Act" (20 ILCS 3410); the "Illinois State Agency Historic Resources Preservation Act" (20 ILCS 3420); and the "Archaeological and Paleontological Resources Protection Act" (20 ILCS 3435).

As defined in the Historic Preservation Act, a Historic Place means "(1) any parcel or contiguous grouping of parcels of real estate under common or related ownership or control, where any significant improvements are at least 40 years old, or (2) any aboriginal mound, fort, earthwork, village, location, burial ground, historic or prehistoric ruin, mine case or other location which is or may be the source of important archeological data" [20 ILCS 3410/2(e)].

The Historic Preservation Act establishes the Illinois Register of Historic Places (20 ILCS 3410/6). Privately owned places can only be listed with the owner's consent (20 ILCS 3410/6). Following designation as a historic place, a notice is sent to the recorder of the county where the site is located (20 ILCS 3410/6). Once listed, the "Critical Historic Features" cannot be demolished without the approval of the Director of Historic Preservation and the issuance of a Certificate of Compliance (20 ILCS 3410/7). Owners of historic properties may be eligible for certain tax benefits.

Through the Archaeological and Paleontological Resources Protection Act (20 ILCS 3435), the state "reserves to itself the exclusive right and privilege of regulating, exploring, excavating or surveying, through the Historic Preservation Agency, all archaeological and paleontological resources found upon or within any public lands" (20 ILCS 3435/1). Public land includes land owned by the state, a municipality, and units of local government [20 ILCS 3435/.02(e)]. Through this Act, county and municipality undertakings on public lands are required to protect historic resources.

The Illinois State Agency Historic Resources Preservation Act (20 ILCS 3420) establishes "High Probability Areas" for archaeological resources. According to this Act, archaeological investigations are required for private undertakings in high probability areas unless the Director of Historic Preservation determines that an investigation is not necessary [20 ILCS 3420/6(c)]. Archaeological investigations can also be required for private undertakings when a known archaeological site is present on the property where the undertaking is proposed.

Private undertakings that need state agency approval may be required to identify historic resources and evaluate the likelihood that the undertaking may have an adverse effect upon historic resources [20 ILCS 3420/4(a)]. In this Act, the term historic resource "means any property which is either publicly or privately held" and which is (1) listed, (2) eligible for listing, (3) has been nominated for listing, or (4) "meets one or more criteria for listing in the National Register as determined by the Director" or (5) "is listed in the Illinois Register of Historic Places" [20 ILCS 3420/3(c)(1-5)].

This *Regional Framework Plan* contains policy recommendations for establishing a countywide historic preservation program and adopting a procedure to inform the state Director of Historic Preservation of development activities that are proposed for high probability archaeological areas or that might adversely effect historic resources.

Scenic Landscapes

Scenic landscapes are areas that highlight the special natural, historic, and cultural features of a region. "Public perception of community character is based largely on what can be seen from an automobile" (Arendt, 1994:192). Therefore, scenic landscapes are often inventoried and protected as scenic corridors and vistas visible from public roads. Scenic corridors and vistas can be designated based on the remaining aesthetic quality of the visible landscape versus the extent to which development intrudes upon the traveler's enjoyment of the view.

Scenic corridors provide an enjoyable and relaxing experience for travelers, while providing local communities with substantial benefits, such as higher property values and increased tourism revenue. Protecting scenic corridors and vistas from the effects of haphazard development allows a community to preserve its unique charm and attract positive growth to the area.

Scenic corridors give communities an opportunity to protect working lands and recognize their aesthetic, cultural, and natural value. Communities often use scenic byway designations to protect and promote their natural beauty and distinctive character. Working landscapes frequently help to define the local sense of place. Communities are also using scenic byway designations to protect working lands and their visual character through acquiring scenic easements and community education.

Lake County does not currently have an inventory of scenic landscapes. One of the recommendations of this *Plan* is to inventory scenic landscapes as a first step towards creating a program to protect the County's scenic corridors and vistas. This inventory and program should be coordinated with municipalities and future historic and archaeological preservation programs.

Priority Open Space

A primary objective of this chapter is to identify and map areas that should be considered priorities for maintaining as open space and low intensity land uses. Based on input received from local, state, and federal environmental agencies,[3] a resource point system has been utilized to identify Priority Open Space areas. The resource scores, as modified based on input from the Lake County Regional Planning Commission, municipal, and township officials, are shown in Figure 4.10. Soil resources and constraints, in the form of Prime Agricultural Soils and Highly Erodable Land soils, are included in the Agricultural Protection section of this chapter.

Resources for which no current inventory data are available, are shown on the table with a score of "N/A". When inventories are available for these resources, they should be included on future Priority Open Space maps. Until such inventories are available, these resources should be

[3]County, state, and federal agencies represented at one or both of the meetings on Environmental Resources held in June and July 2001 include:
Lake County Forest Preserve
Lake County Health Department; Lakes Management Unit
Lake County Management Services; Map Services Division
Lake County Planning, Building and Development; Engineering and Environmental Services Division
Lake County Soil and Water Conservation Service
Lake County Stormwater Management Agency
Illinois Department of Natural Resources
U.S. Department of Agriculture; Natural Resource Conservation Service
U.S. Fish and Wildlife Service

considered based on detailed site inventories to be completed as individual properties are considered for development or preservation. This methodology is consistent with the approach recommended by the Natural Lands Trust (1997:3-3).

The scores for resource areas have been aggregated for Public Land Survey quarter-quarter sections, which are approximately 40 acres in size. The quarter-quarter sections have been classified in order that one-third of the County is identified in each of the following categories: High Priority Open Space Areas; Moderate Priority Open Space Areas; and Limited Priority Open Space Areas. Open water, existing protected open space, and existing developed areas have been overlaid on the quarter-quarter sections to create the Priority Open Space Map, shown in Figure 4-11.

Figure 4.10
Environmental Resource Priority Scores

Environmental Resource	Score
Illinois Natural Areas Inventory Sites	10
T & E Species	10
Steep Slopes (8% and greater)	6
Forest and Prairie Areas	N/A
Aquifer Recharge Areas (categories to be determined)	N/A
Historic, Archaeological, And Scenic Resources	N/A
Surface Water	
High Value Aquatic Resource Streams	10
Moderate Value Aquatic Resource Streams	8
Other Streams	4
Lakes and Ponds	4
Wetlands and Soils	
ADID Wetlands	10
LCWI 20 acre and larger	8
LCWI 5-20 acres	6
LCWI 0-5 acres	4
Hydric Soils 10 acres and larger	4
Hydric Soils under 10 acres	2
Flood Areas	
Flood of Record	6
Floodplains and Floodways	
SMC Flood Hazard Mitigation Areas	
Protected Open Space	
State Parks and State Natural Areas	6
Lake County Forest Preserve Land	
Libertyville Township Open Space	
Nature Preserves	6

Based on recommendations received from resource agencies, the Priority Open Space Map should be utilized for the following purposes:

1. Determine capacity of the County to accommodate additional population growth and economic development without encroaching on high priority open space areas.

2. Serve as the basis for developing a Future Land Use Map and policies that recognize environmental resources.

3. Serve as the basis for the policies for the protection and enhancement of natural resources.

4. Provide a tool for the preliminary screening of development projects to ensure the protection of on-site resources and the implementation of greenbelt corridors that link open space between individual development projects.

5. Provide guidance for the update of local comprehensive plans, including future land use maps and policies

6. Provide guidance for the acquisition of public open space for environmental protection and enhancement and recreational uses.

7. Serve as a tool for guiding the placement and expansion of public infrastructure to avoid encouraging inappropriate land development.

Within high priority open space areas, the overall density and intensity of land use should be limited. A variety of methods should be employed to preserve and enhance the environmental qualities of these areas. Some areas identified as high priority open space may be appropriate for public acquisition or for protection through purchase of development rights or conservation easement programs. In other high priority open space areas, zoning and subdivision regulations can be used to direct the type and intensity of development and uses that are compatible with the environmental resources.

Public agencies and private conservation organizations acquiring land must have funds available to adequately maintain the property to ensure the protection and enhancement of its desirable environmental characteristics.

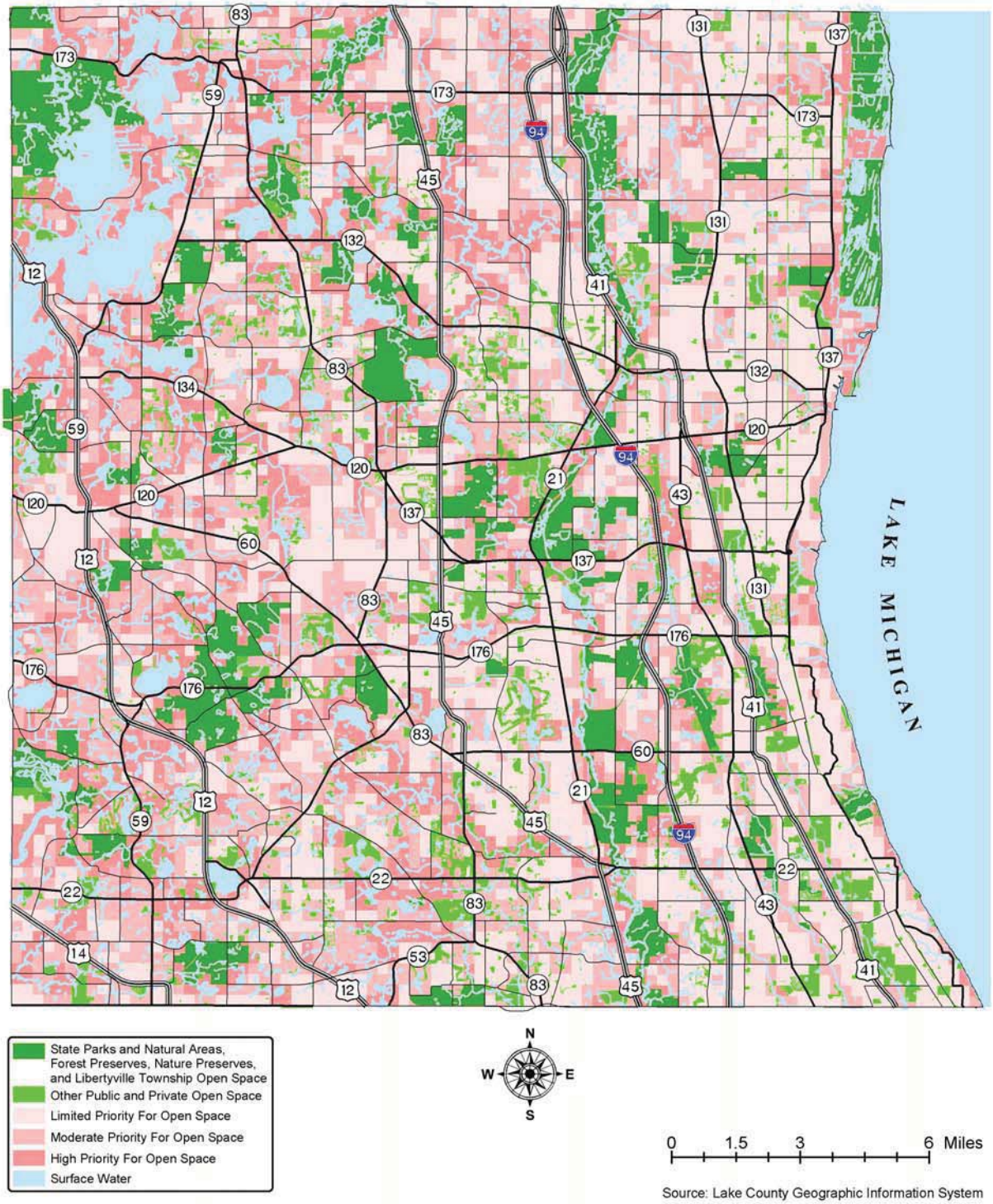
In areas identified as having moderate open space priority, the intensity of development can be higher. Areas identified as having limited open space priority should receive the highest intensity of development. These areas should accommodate the majority of the County's forecast population and employment growth. The Priority Open Space Map has been utilized extensively in creation of the Future Land Use Map, as discussed in Chapter 9, Land Use.

The Priority Open Space Map is intended as a future land use planning and open space preservation planning tool. This *Plan* does not anticipate the acquisition of all areas identified as High Priority Open Space as public open space. The Lake County Forest Preserve District is the principal agency acquiring land for environmental resource protection in Lake County. For the Forest Preserve to be successful in negotiating future land purchases, it cannot release details regarding its future land acquisition plans.

The Forest Preserve District has adopted general goals for land acquisition. These goals include:

1. Protect Wildlife Habitat;
2. Preserve Wetlands, Prairies, and Forests;
3. Provide Trails, Greenways, and River/Lake Access;

Figure 4.11
Priority For Open Space



4. Protect Against Flooding;
5. Save Large Refuges; and
6. Expand Existing Preserves.

The factors considered in identifying priority open space are generally consistent with the Forest Preserve District goals.

Environmental Limitations

Figure 4.12 contains an Environmental Limitations Map, showing the location of the most critical environmental resources. Severe Environmental Limitation areas and Moderate Environmental Limitation areas are also included on the Future Land Use Map, as discussed in Chapter 9, Land Use. Areas with Severe Environmental Limitations include Advanced Identification (ADID) Wetlands with 100-foot buffers, Floodways, and Nature Preserves. Areas with Moderate Environmental Limitations include floodplains, Floods of Record, SMC Flood Hazard Mitigation Areas, and Lake County Wetland Inventory (LCWI) wetlands. Areas with Severe Environmental Limitations are generally undevelopable. Areas with Moderate Environmental Limitations can only be developed if appropriate mitigation measures are provided. Chapter 9, Land Use, contains Goals and Policies to limit and guide development of Environmental Limitations areas.

Areas with Severe Environmental Limitations and Moderate Environmental Limitations should be respected during the development process. Cluster development may be one method for protecting areas with environmental limitations, while accommodating desirable development. Regardless of how an area is shown on the Priority Open Space Map or the Environmental Limitation Map, individual environmental resources must be identified and protected through the development review and permitting processes. Public acquisition or conservation easements should be considered when the resource is unique or rare and permanent protection is desired.

Farmland Preservation

In 2001, the Lake County Board identified farmland protection as a high priority target issue. The County retained the services of the American Farmland Trust (AFT) to assist with development of this element of the Regional Framework Plan. The data and policy analysis contained in this section is largely derived from the resulting report, *On Thin Soil: The Uncertain Future of Agriculture in Lake County* (AFT, 2001). AFT concluded that saving farmland in Lake County will be a challenge, but it is possible. The report contains policy options and possibilities for protecting farmland as a resource (AFT,2001:15-22) and farming as an economic activity and way of life (AFT, 2001:22-27).

The AFT report contains trend data for farmland and farming activities based on the U.S. Department of Agriculture, Census of Agriculture, other statistical sources, and data collected through two focus group meetings and telephone interviews conducted with farmers and farmland owners. One focus group was for traditional farmers, who produce cash grains and livestock. The other focus group was for non-traditional farmers including nursery and landscape operators, vegetable growers, and equestrians. Nineteen individuals participated in the two focus groups. AFT also conducted approximately 12 telephone interviews with farmland owners (AFT, 2001:9).

Farming Activities

Between 1982 and 1997, the number of farms in Lake County decreased from 513 to 335, a drop of 35% (AFT, 2001:2). This decreasing number of farms is in keeping with national trends. Agriculture contributes $36 million to the Lake County economy (IMPLAN Multiplier Reports, 1998, as cited in AFT, 2001, Chart 1). The largest sector is greenhouse and nursery products with a total output of $21.6 million. The next largest sector is food and feed grains with a total output of just over $4 million.

The total market value of Lake County agricultural products sold decreased from 1982 to 1987, but increased from 1987 to 1997 (Census of Agriculture as cited in AFT, 2001, Chart 3). The total market value of agricultural products sold was $28.94 million in 1987 and $32.25 million in 1997. Greenhouse and nursery products accounted for 58% of agricultural sales in 1997, up from 33% in 1982.

Agriculture provides approximately 600 jobs in Lake County (IMPLAN Multiplier Reports, 1998 as cited in AFT, 2001, Chart 2). By way of comparison, Lake County's total private sector employment in 1999 was over 305,000. (See Chapter 3, Economy and Employment.) According to IMPLAN Multiplier Reports for 1998, nearly half of Lake County's agricultural jobs are in the greenhouse and nursery industry (as cited in AFT, 2001, Chart 2). Farm payroll in Lake County increased from 1982 to 1992, and then decreased from 1992 to 1997, when the total farm payroll was $7.54 million. Agricultural services employment increased steadily from 1,006 in 1982 to 3,381 in 1997, an increase of 236% (U.S. Census Bureau, County Business Patterns, as cited in AFT, 2001, Chart 6). Agricultural services includes crop services, veterinary services, other animal services, and landscape and horticultural services.

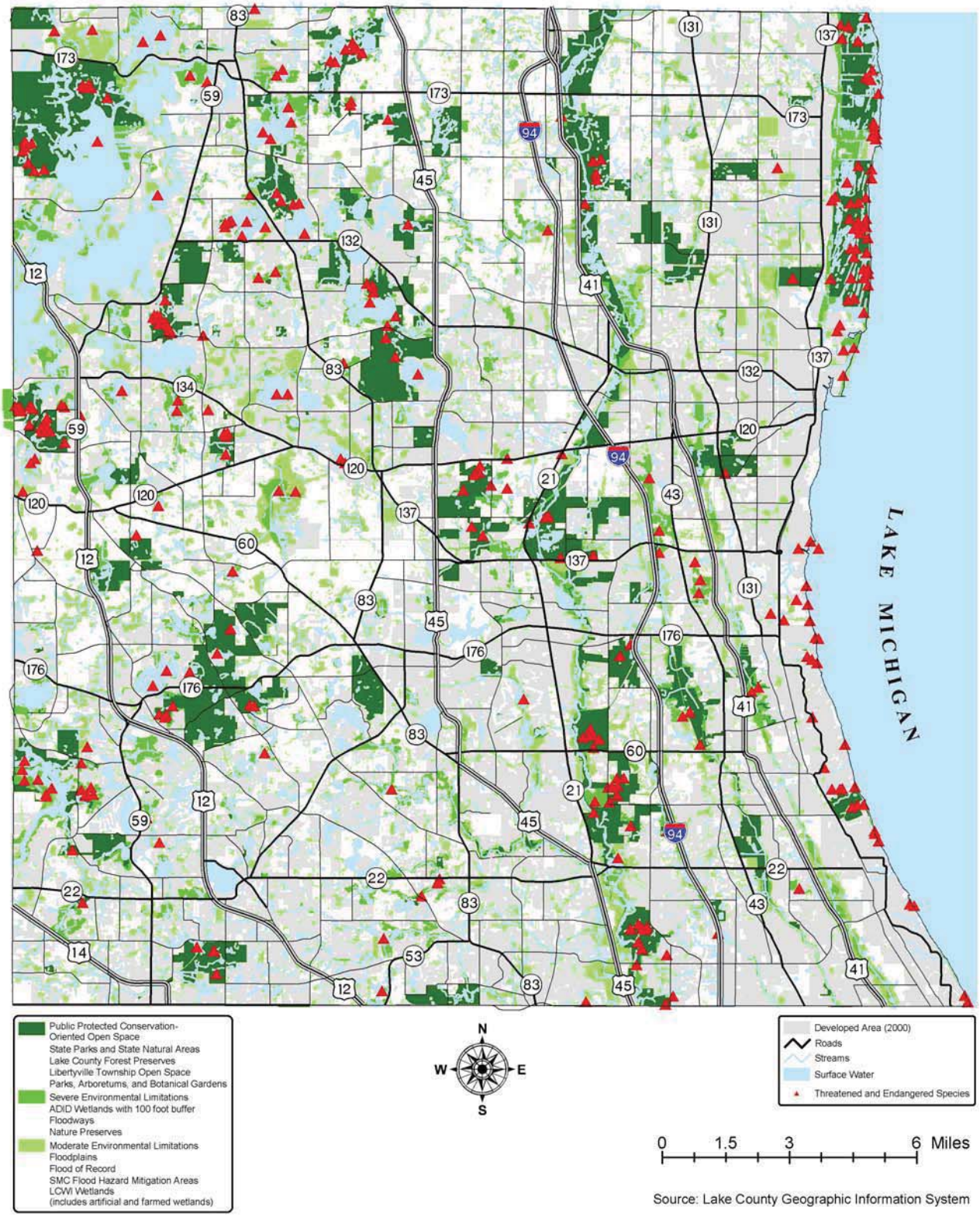
AFT concluded that the overall economic impact of agriculture in Lake County is small compared to other counties, such as Kane County, and small compared to other economic activities in the County (AFT 2000:3). The agricultural profile of Lake County is dominated by the growth of the nursery industry and landscape and horticultural services (AFT 2001:2). Nurseries, fruits and vegetables, and equestrian operations are the most viable agricultural activities in Lake County.

Farmland

The 1997 U.S. Department of Agriculture, Census of Agriculture, reported that Lake County had approximately 50,000 acres of remaining farmland. By way of comparison, the Lake County 2000 Land Use Inventory identified approximately 43,658 acres of land in agricultural use. According to the AFT report, between 1982 and 1997 the average size of existing farms decreased from 180 acres to 152 acres, a drop of 16%. The decreasing average farm size is a reversal of the national trend, which is for larger farms (AFT, 2001:2). The decreasing farm size in Lake County is attributable to the decline of cash grain and livestock operations and the rise of non-traditional agricultural activities including vegetable and nursery operations (AFT, 2001:2).

The Agricultural Use Inventory map, shown in Figure 4.13, shows agricultural use areas based on the 2000 Land Use Inventory. This map also shows whether these areas have Prime Agricultural Soils, Highly Erodable Land soils, both (which is possible because some Prime Agricultural Soils are also highly erodable), or neither.

Figure 4.12
Environmental Limitations



Prime Agricultural Soils have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses. Prime Agricultural Soils should be protected where possible for agricultural uses.

Highly Erodable Land is defined as soil "that has, or that if used to produce an agricultural commodity, would have an excessive average annual rate of erosion in relation to the soil loss tolerance level…" (United States Food Security Act, 1985:4-2) The National Food Security Act Manual 3rd Edition (1996) requires that the USDA Natural Resource Conservation Service determine the potential erodability of each soil map unit based on the Universal Soil Loss Equation, which includes consideration of rainfall and runoff; susceptibility of the soil to water erosion; and the combined effects of slope length and steepness. The soil map units are identified in the 1970 Soil Survey, Lake County, Illinois (USDA SCS, 1970). Conservation plans approved by the Soil and Water Conservation District are required for these areas or farmers will not qualify for many federal agricultural programs, under the 1985 Food Security Act.

As mapped in Figure 4.13, 72% of the agricultural use area contains Prime Agricultural Soils. An additional 1% of the agricultural use area contains soils that are classified both as Prime Agricultural Soils and as Highly Erodable Land. These areas have excellent production potential, but must be appropriately managed. Nearly one-quarter (24%) of the agricultural use area is classified as Highly Erodable Land. The remaining 3% of the agricultural use area has neither Prime Agricultural Soils nor Highly Erodable Land.

According to the AFT study much of the remaining farmland in Lake County is not owned by individuals that are farmers by profession (AFT 2001:5). The AFT identified 10 entities that combined owned approximately 20% of the remaining farmland in Lake County. Each of these entities owned at least 200 acres. This analysis included only parcels of 20 acres or more. Four of the seven owners AFT was able to contact indicated that they have at least some level of interest in keeping their land undeveloped (AFT 2001:6).

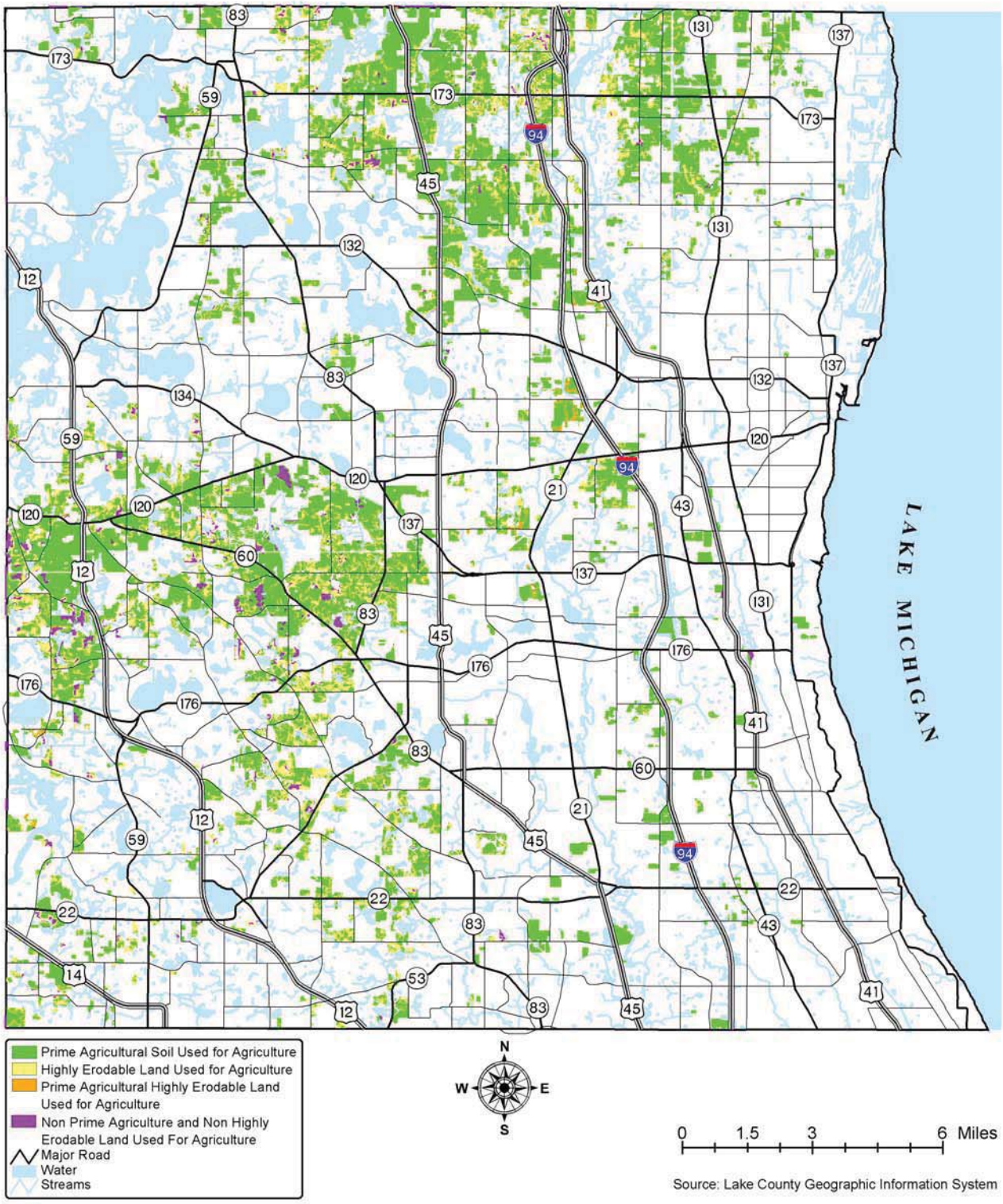
Costs of Services

In addition to retaining the opportunity for agriculture and providing desirable open space, the American Farmland Trust points out that farmland does not cost much for a local community to service. The American Farmland Trust has developed a methodology for communities to compare the cost of delivering public services to various land uses. With at least 83 of these "cost of community services studies" completed, AFT has concluded that, on average, farm and forestlands cost 36 cents for every dollar of property tax revenue generated. That compares to a cost of 27 cents for industrial/commercial property per dollar of revenue raised, and $1.15 of costs for residential housing for every dollar of tax revenue generated (AFT, 2001:4). In this manner, agricultural activity provides an opportunity for low-cost economic development.

The AFT recommendations for protecting agricultural activities include the following:

- Help keep the nurseries and other high-value agricultural operations viable. Start with a simple conversation with these growers to determine their needs and interests. High land prices may limit their expansion plans, but County government should do what it can to help sustain these businesses.

Figure 4.13
Agricultural Use Inventory



- Consider changing zoning and other regulations to make it easier for small farmers retailing to consumers to stay in business. These businesses provide fresh produce, bedding plants, and other agricultural products directly to consumers and their presence adds to the quality of life of Lake County. Their unique needs can and should be accommodated.

- Give serious consideration to creating a farm heritage center in Lake County that reflects the community's agricultural heritage but is run as a working commercial farm. Create a task force of interested parties to develop the details of this concept.

- Commit more County park planning, land acquisition, and perhaps residential development planning to accommodate equestrian interests. Horses require large tracts of land for boarding, pasturing, and crops to feed them, and the equestrian community is committed to exploring ideas.

Goals and policies based on the American Farmland Trusts recommendations for protecting farmland and farming activities are included in the Goals and Policies section of this chapter.

Air Quality

Air quality is measured based on two types of air pollutants: criteria pollutants and hazardous air pollutants. Criteria pollutants are six chemicals that occur frequently in ambient air and can injure human health, harm the environment, or cause property damage. These chemicals include carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide. The U.S. Environmental Protection Agency (USEPA) has set health-based criteria as a basis for regulating these pollutants, hence the name "criteria pollutants" (www.epa.gov). Hazardous air pollutants (HAPS) cause cancer, birth defects, and other adverse effects to humans, as well as environmental damage. Compared to the six criteria pollutants, the number of HAPS is well over 100. The USEPA has not set health-based criteria for these pollutants.

The Chicago-Gary-Lake County, IL-IN region is in violation of the National Ambient Air Quality Standards (NAAQS), which are intended to protect the public health and welfare from any known or anticipated adverse effects of criteria pollutants. The region is classified as a "severe" non-attainment area for ozone (USEPA, 2004:1). Ozone, which is a criteria pollutant associated with smog, is formed when nitrogen oxides and volatile organic compounds (VOCs) react with sunlight. (IEPA, 2003:iii).

According to the Illinois Environmental Protection Agency (IEPA), air quality trends for criteria pollutants are continuing to show a downward trend in Illinois. Statewide, ozone levels decreased 7% between 1991 and 2000 (IEPA, 2001:ix). "However, [in 2002] as a result of emissions and high temperatures experienced over a short period of time, exceedances were recorded at critical monitoring sites in the region and attainment was not reached." (IEPA, 2003:iii).

IEPA operates four ambient air quality monitoring stations in Lake County: Deerfield, Libertyville, Waukegan, and Zion. All four locations monitor ozone levels. The Zion location also monitors nitric oxide, nitrogen dioxide, and volatile organic carbon levels. In 2000, none of the four monitoring locations reported any exceedances of the 1-hour limit for ozone (IEPA, 2001:48). In 2002, however, the 1-hour standard for ozone was exceeded on one day at

Waukegan and on three days at Zion. In addition, the new 8-hour limit for ozone, which is being implemented by the USEPA, was exceeded on five days at Libertyville, on seven days at Waukegan, and on nine days at Zion.

The Air Quality Index (AQI) is the national standard method for reporting daily air pollution levels for the six criteria pollutants (IEPA, 2001:15). The air quality descriptions include: Good, Moderate, Unhealthy for Sensitive Groups, Unhealthy, Very Unhealthy, and Hazardous. In 2000, the AQI index for Lake County was Good 96% and Moderate 4% of days (IEPA, 2001:19). In 2002, the AQI index for Lake County was Good 80%, Moderate 17%, Unhealthy for Sensitive Groups 2%, and Unhealthy 1% of days (IEPA, 2001:19). Lake County and municipal officials should carefully review future air quality reports to determine if the spikes in ozone pollution in 2002 indicate a downward trend or one-time anomaly.

The state of Illinois has adopted a State Implementation Plan, which identifies programs to reduce emissions that lead to the formation of ground-level ozone pollution in the region. In order to address mobile source emissions, the Chicago Area Transportation Study (CATS), which is the region's Metropolitan Planning Organization (MPO), is required to undertake conformity studies for transportation improvement plans and programs.

Because the USEPA has not set health-based criteria for hazardous air pollutants, no official air quality index is available for this type of pollution. The not-for-profit Environment Defense Fund has ranked counties based on each county's "added cancer risk from hazardous air pollutants". According to its analysis, Lake County ranks among the worst 10% of all counties in the U.S. for added cancer risk from hazardous air pollutants. This ranking is based on exposure estimates derived from 1996 emissions data. "There are important uncertainties associated with using models to predict current air quality. Scorecard risk estimates are based on EPA exposure estimates and provide a perspective on the magnitude and sources of hazardous air pollution problems. They are not definitive evaluations of health risk in a particular locale" (http://www.scorecard.org).

In the Chicago Metropolitan Area non-attainment area, mobile sources (on-road and off-road) contribute 83% of the total anthropogenic ozone precursor emissions on a typical summer day, based on 1996 Illinois Environmental Protection Agency data. Mobile sources also make up 92% of the added cancer risk due to exposure to hazardous air pollutants in Lake County, based on the Environment Defense Fund analysis (http://www.scorecard.org).

Improved land use planning is necessary for avoiding worsening air pollution from mobile sources. Chapter 7, Transportation, and Chapter 9, Land Use, of this *Plan* contain recommendations for creating an efficient land use/transportation pattern and targeting development and redevelopment activities in transit and employment centers, where it should be designed to encourage walking, bicycling, and transit usage.

Goals and Policies[4]

4.1 **Goal:** Preserve and enhance the County's environmental resources including high quality wetlands, prairies, and forests and protect the County's wildlife habitat.

[4] As stated in Chapter 1, Introduction, a Goal is "the desired result to be achieved by implementing the *Plan*;" and a Policy is "a general method or action designed to achieve a goal."

4.1.1 Policy: Protect and enhance high quality habitat necessary for the survival of a diversity of plant and animal species.

4.1.2 Policy: Focus environmental resource and open space protection efforts in areas identified on the Priority For Open Space Map as High Priority For Open Space.

4.1.3 Policy: Encourage government agencies and private conservation organizations to purchase and/or acquire conservation easements in areas that contain exceptional or unique environmental resources.

4.1.4 Policy: Within unincorporated areas identified as High Priority For Open Space and Moderate Priority For Open Space, designate future land uses that limit the overall density and intensity of development and that are compatible with the protection and enhancement of environmental resources.

4.1.5 Policy: To the fullest extent possible development should occur within areas identified on the Priority Open Space Map as Built-Up or Limited Priority For Open Space.

4.1.6 Policy: Within incorporated municipalities and areas identified as Built-Up or Limited Priority For Open Space designate future land use areas with development intensities and densities sufficient to support new and improved transit options and to accommodate projected population and employment growth through 2020, in a manner consistent with local planning objectives and this *Regional Framework Plan*.

4.2 Goal: Encourage the interconnection of public open space, private open space, and greenways and trails to create landscape linkages that provide corridors for wildlife and recreational opportunities.

4.2.1 Policy: Encourage the Lake County Forest Preserve, Lake County Stormwater Management Commission, municipal, township, state, federal, and private conservation organizations to coordinate and maximize their land acquisitions and provide landscape linkages where appropriate.

4.2.2 Policy: Encourage local governments to require that open space protected through the development review process align with existing and potential adjacent open space and trails.

4.2.3 Policy: Encourage local governments to require developers of large parcels to provide public access easements on areas identified as open space via deed restrictions or homeowners association ownership.

4.2.4 Policy: Encourage the use of cluster development (conservation subdivision) design to retain open space within developing areas.

4.2.5 Policy: Recognizing the need of the Lake County Forest Preserve, state of Illinois, and federal resource agencies to act quickly when land becomes available and to negotiate purchases in confidence; municipalities and

preservation agencies should proactively coordinate their long range plans to avoid conflicts regarding future land use, acquisitions, and annexations.

4.3 **Goal:** Protect existing water resources and water quality including lakes, streams, floodplains, and wetlands, from detrimental and unnecessary modification so that their beneficial functions are maintained and public expenditures and damages are minimized (SMC, 2002).

4.3.1 Policy: Identify, map, and prioritize all components of the natural hydrologic system. Select critical components for a high level of public protection, enhancement and management.

4.3.2 Policy: Establish a financial mechanism and program to acquire remaining undeveloped natural waterways and hydric soils areas through the tools of fee simple purchase, conservation easements, transfer of development rights and developer dedications.

4.3.3 Policy: Coordinate all federal, state, local, and private non-profit natural resource groups and their activities toward mutual goals and consensus priorities utilizing a shared GIS database and environmental restoration models as the organizational platform.

4.3.4 Policy: Lake County will promote the use of Best Management Practices to continue to improve the quality of effluent and other discharges into surface water.

4.4 **Goal:** Reduce or mitigate the environmentally detrimental effects of existing and future runoff in order to improve and maintain water quality and protect water related environments.

4.4.1 Policy: Require full, functional mitigation for all physical and environmental impacts resulting from disturbance or alterations to water resources.

4.4.2 Policy: Utilize natural systems and solutions for water quality and quantity mitigation in preference to structural improvements.

4.5 **Goal:** Establish comprehensive watershed management plans within each sub-watershed, which quantify, plan for, and manage stormwater flows, absorption, and transpiration within and among the jurisdictions in those watersheds.

4.5.1 Policy: Require all development plans, Facility Planning Area (FPA) Amendments and engineering plans to be consistent with the watershed's resources and capacity limitations.

4.5.2 Policy: Watershed plans shall be developed at a level of detail to sufficiently guide member jurisdictions in development location, land use intensity and design decisions so that the natural hydrologic system is not overwhelmed and degraded.

4.6 **Goal:** Identify and preserve historic, archaeological, and paleontological resources and scenic corridors and vistas in Lake County, in cooperation with municipal and other local government agencies.

4.6.1 Policy: Assemble the available information on known historic, archaeological, and paleontological sites in Lake County, in cooperation with municipal and other local government agencies.

4.6.2 Policy: Inventory scenic landscapes and corridors, in cooperation with municipal and other local government agencies.

4.6.3 Policy: Develop a procedure for informing the State Director of Historic Preservation of public or private undertakings 1) that are proposed for high probability archaeological areas; or 2) that might adversely effect historic resources, in accordance with Illinois Statutes.

4.6.4 Policy: Create a historical preservation commission to develop a countywide historic preservation program and to advise the County Board, municipalities, and regional organizations on historic preservation issues.

4.7 **Goal:** Protect the aquifer recharge areas and groundwater resources of Lake County and the region.

4.7.1 Policy: Join with other governmental agencies to petition for state and federal funding for research to determine the amount of water available in the deep bedrock and shallow aquifer systems that serve Lake County.

4.7.2 Policy: Join with other government agencies to fund studies and develop a monitoring program to discover the impacts of water withdrawals on aquifers and surface waters.

4.7.3 Policy: Join with other governments to provide funding to identify capture zones around public water wells and map groundwater contamination potential throughout the region.

4.7.4 Policy: Prepare local aquifer recharge areas and groundwater protection plans that consider, among other factors, land use and zoning, open space preservation, and Best Management Practices.

4.8 **Goal**: Preserve select remaining farmland.

4.8.1 Policy: Promote new and expanded farming activities, including equestrian operations and businesses that provide fruits and vegetables, landscaping materials, and other agricultural products directly to consumers.

4.8.2 Policy: Create a public-private task force to develop the concept of the model "working" farm that incorporates the heritage of farming in Lake County as well as the latest farming methods.

4.8.3 Policy: Invite a broad range of persons and businesses involved in the growing and raising of agriculture products to analyze the impacts of County regulations

on farming operations. The main purpose would be to identify County regulations that make it difficult to start, expand, or continue agriculture operations.

4.8.4 Policy: Develop a working relationship with conservation trusts and open space preservation organizations to potentially establish partnerships to protect farmers who want to keep farming but need financial incentives.

4.8.5 Policy: Study other alternatives as time and resources permit to help retain the farming, open space, and scenic vistas for future generations.

4.8.6 Policy: Commit more park planning, land acquisition, and residential development planning to accommodate equestrian interests.

4.8.7 Policy: Lake County will consider providing funding for farmland preservation.

4.9 Goal: Eliminate deficiencies in existing environmental inventory maps by identifying and mapping forest lands, additional resource protection open space, aquifer recharge areas, and historic and scenic resources in Geographic Information System formats for inclusion on future environmental inventory maps.

4.9.1 Policy: Form cooperative arrangements with the Lake County Management Services Department and federal, state, and local resource agencies to inventory and map forest lands for inclusion on future environmental inventory maps.

4.9.2 Policy: Form cooperative arrangements with the Lake County Management Services Department and federal, state, and local resource agencies to inventory and map resource protected open space areas, including municipal and township open space, private conservation areas, and deed restricted open space for inclusion on future environmental inventory maps.

4.10 Goal: Improve air quality in Lake County to consistently exceed federal standards.

4.10.1 Policy: Develop a land use pattern and other policies that provide more transportation options and decrease trip lengths in order to reduce the growth in traffic congestion, fuel consumption, and air pollution.

4.10.2 Policy: Review the feasibility of replacing County vehicles with high efficiency, low emission vehicles.

4.10.3 Policy: Promote public awareness of air pollution problems and encourage a shift from less efficient, more polluting vehicles, toward more efficient, less polluting vehicles.

Sources

American Farmland Trust (AFT), 2001, *On Thin Soil: The Uncertain Future of Agriculture in Lake County*, Verona, WI

Arendt, Randall, 1994, *Rural By Design: Maintaining Small Town Character*, Planners Press, Chicago, IL

Berg, Richard C., 2001 (December 4), e-mail from Dr. Richard C. Berg, Illinois State Geological Survey and project chief of the Central Great Lakes Geologic Mapping Coalition Program

Berg, Richard C., Ned K. Bleuer, Berwyn E. Jones, Kevin A. Kincare, Richard R. Pavey, and Byron D. Stone, 1999, Mapping the Glacial Geology of the Central Great Lakes Region in Three Dimensions: A Model for State-Federal Cooperation, U.S. Geological Survey Open File Report 99-349

Consensus Plan Committee, 1998, *A Consensus Plan for Enhancing & Preserving Lake County's Quality of Life*, Lake County, Waukegan, IL

Illinois Environmental Protection Agency (IEPA), 2001, *Illinois Annual Air Quality Report 2000*, Illinois Environmental Protection Agency, Bureau of Air, Springfield, IL

Illinois Environmental Protection Agency (IEPA), 2003, *Illinois Annual Air Quality Report 2002*, Illinois Environmental Protection Agency, Bureau of Air, Springfield, IL

Illinois State Geological Survey, 1998, *Erosion and Accretion Trends Along the Lake Michigan Shore at North Point Marina and Illinois Beach State Park*, Champaign, IL

Lake County Department of Communications, 2000, *Lake County Resident Transportation Survey*, Lake County Department of Communications, Waukegan, IL

Lake County Forest Preserve District, 1989, *Land Acquisition Plan, Part One, Land Classification and Site Suitability Systems*, Lake County Forest Preserve District, Libertyville, IL

Lake County Stormwater Management Commission (SMC), 2002, *Lake County Comprehensive Stormwater Management Plan Draft*

Larsen, Jean I., 1973, Geology for Planning in Lake County, Illinois, Illinois State Geological Survey, Circular 481, Urbana IL.

McHarg, Ian, *Design With Nature*, 1992, John Wiley & Sons, Inc, New York, NY

Morris, Marya, 1992, Innovative Tools for Historic Preservation, National Trust for Historic Preservation and American Planning Association, Planning Advisory Service Report Number 436, Washington DC.

Natural Lands Trust, 1997, *Growing Greener: A Conservation Planning Workbook for Municipal Officials in Pennsylvania*, Natural Lands Trust, Media, PA

Northeastern Illinois Planning Commission (NIPC), 2001 (September), Strategic Plan for Water Resource Management.

U.S. Department of Agriculture, 1970, *Soil Survey Lake County, Illinois*.

U.S. Environmental Protection Agency, 2004, Green Book, printed from Internet on April 23, 2004, http:// www.epa.gov/oar/oaqps/greenbk/onc.html